(No Model.)

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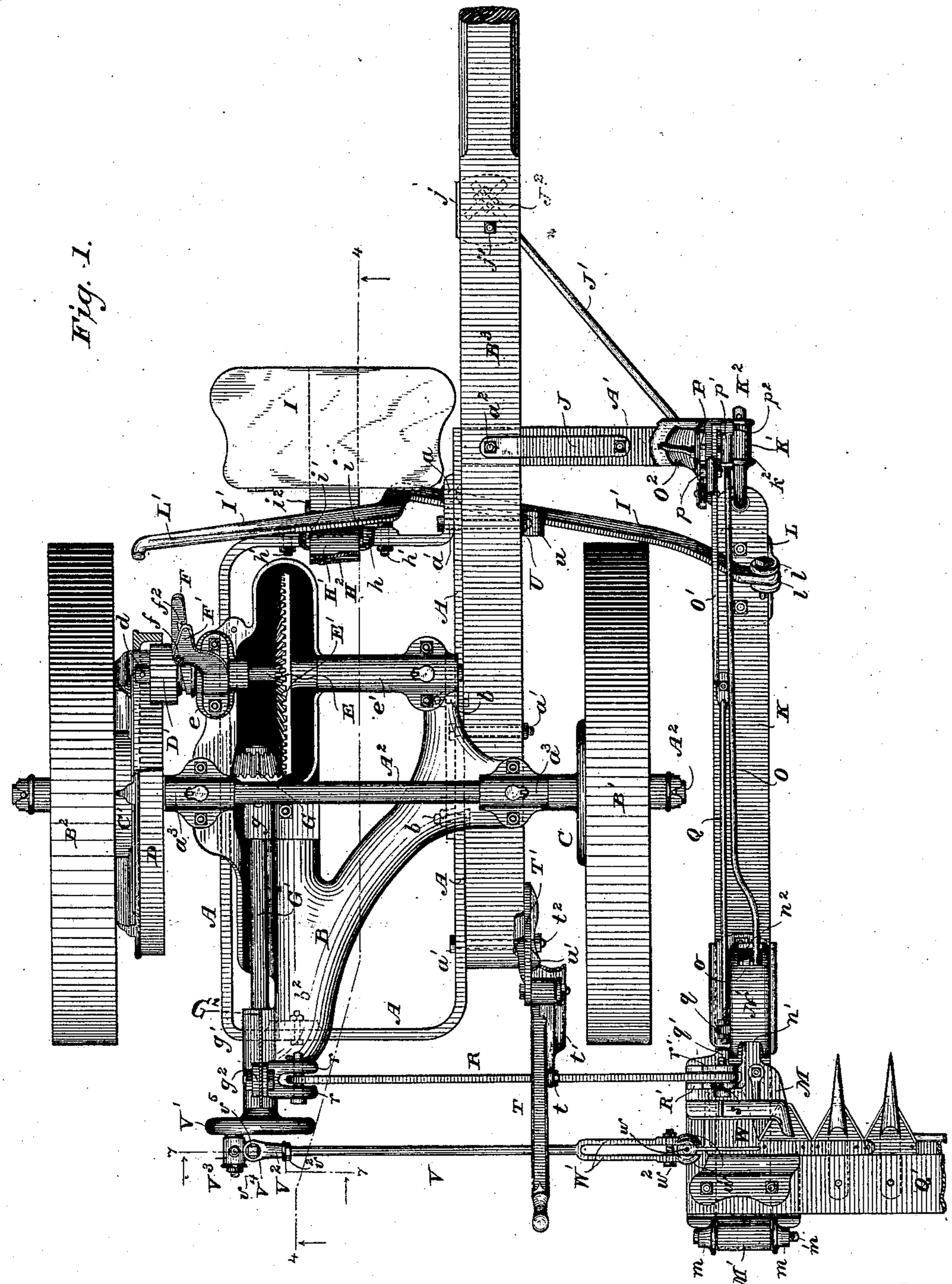
HARVESTER.

No. 272,217. Patented Feb. 13, 1883.

Fig. 1.



WITNESSES

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INVENTOR

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Baldwin, Hopkins & Peyton.

(No Model.) 4 Sheets—Sheet 2.

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Fig. 6.

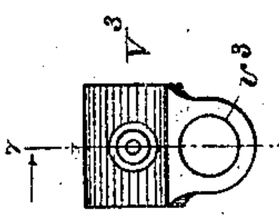


Fig. 7.

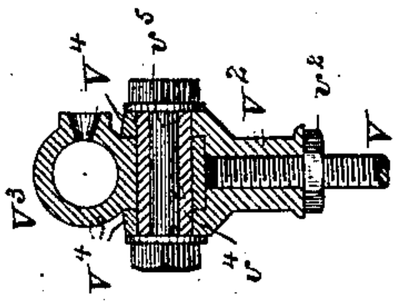
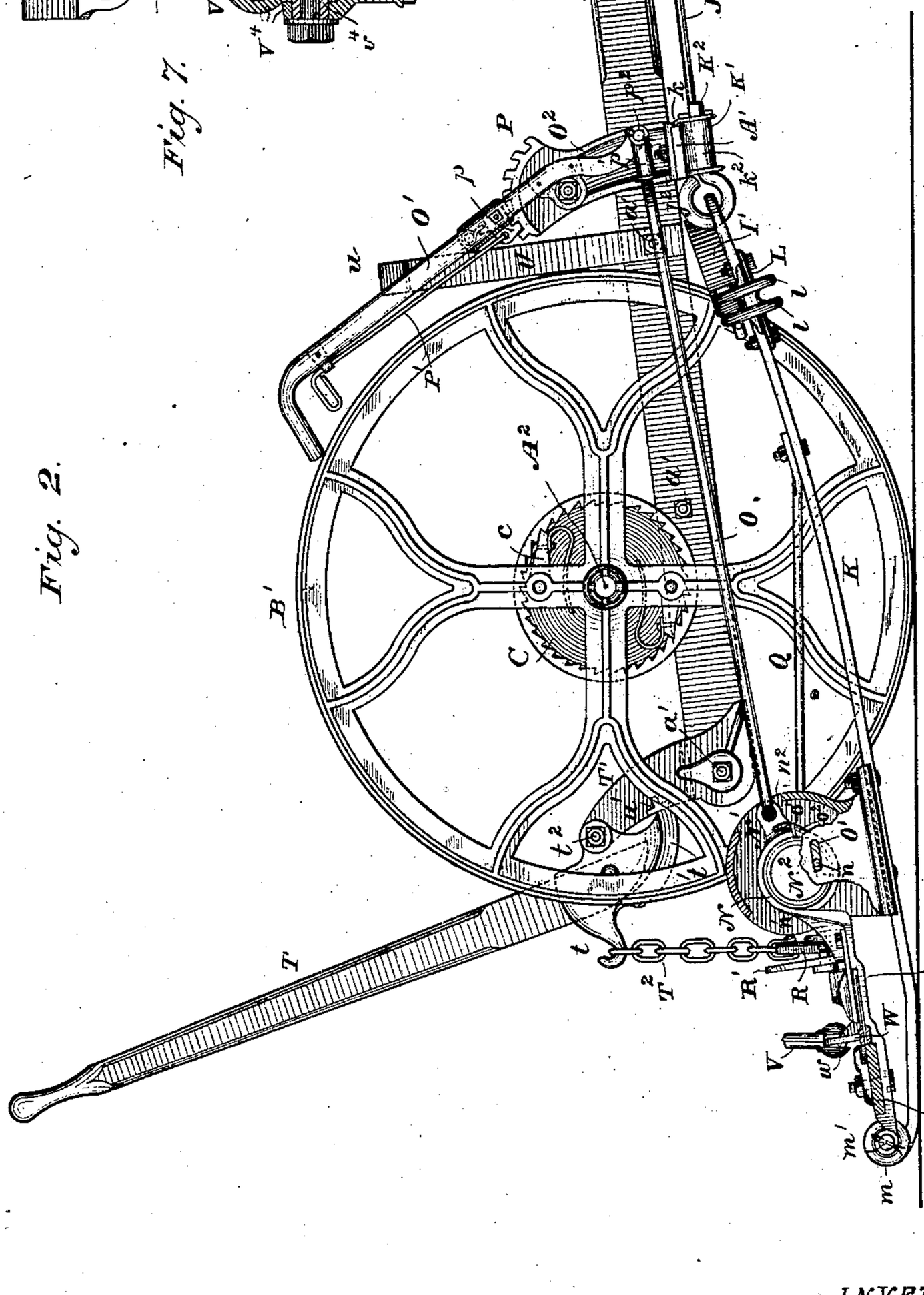


Fig. 2.



WITNESSES

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Fig. 3.

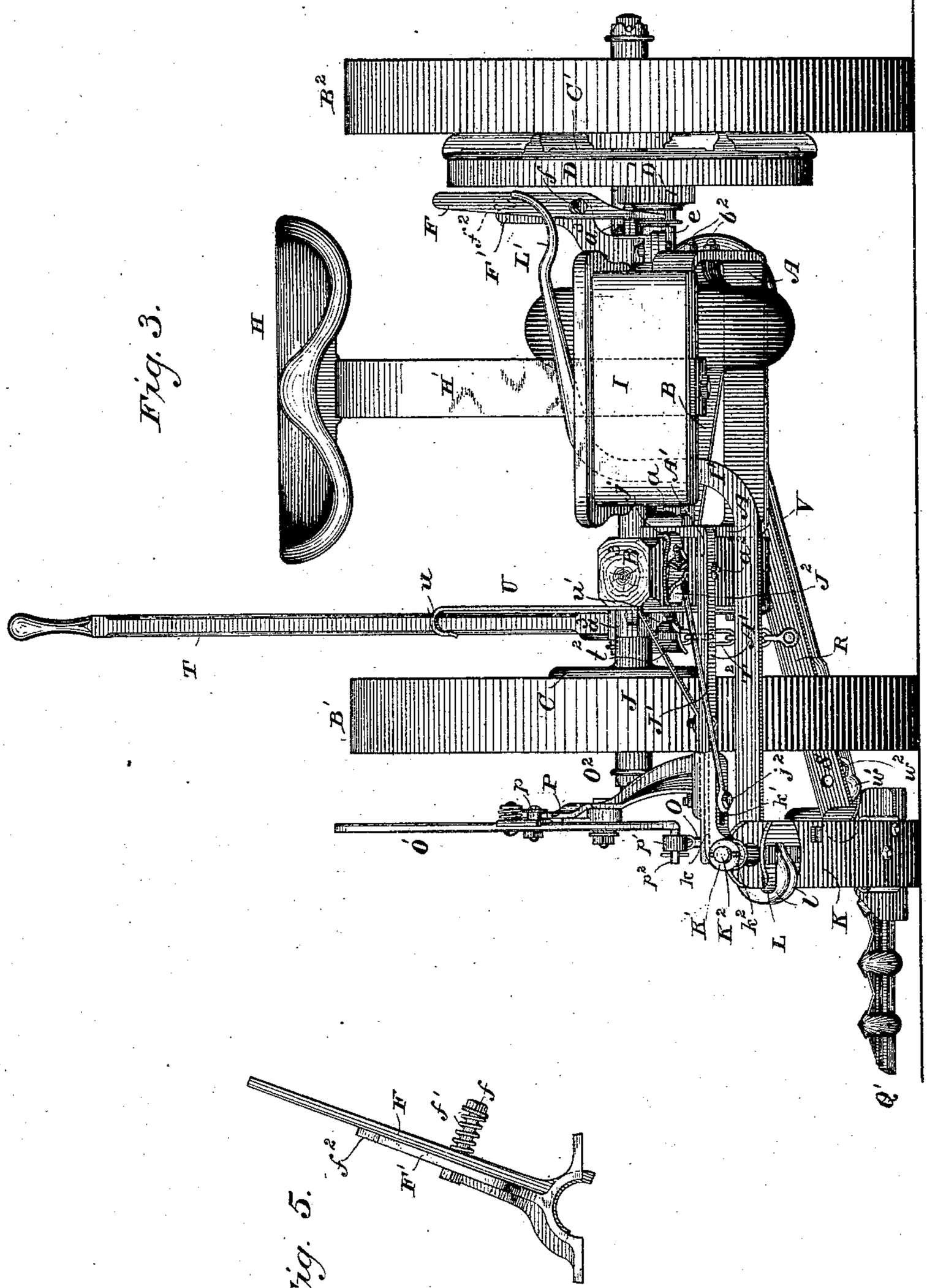

Fig. 5.

WITNESSES

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Fig. 8.

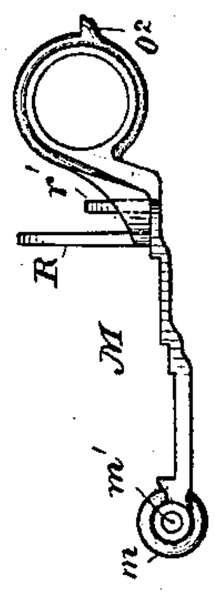


Fig. 9.

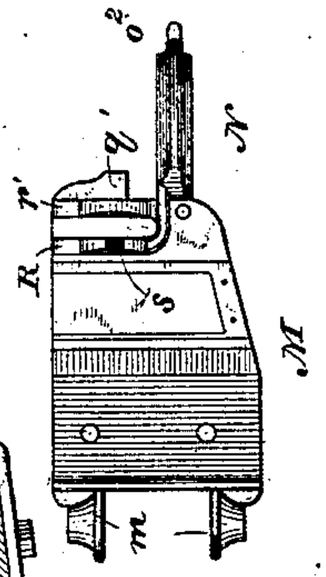


Fig. 4.

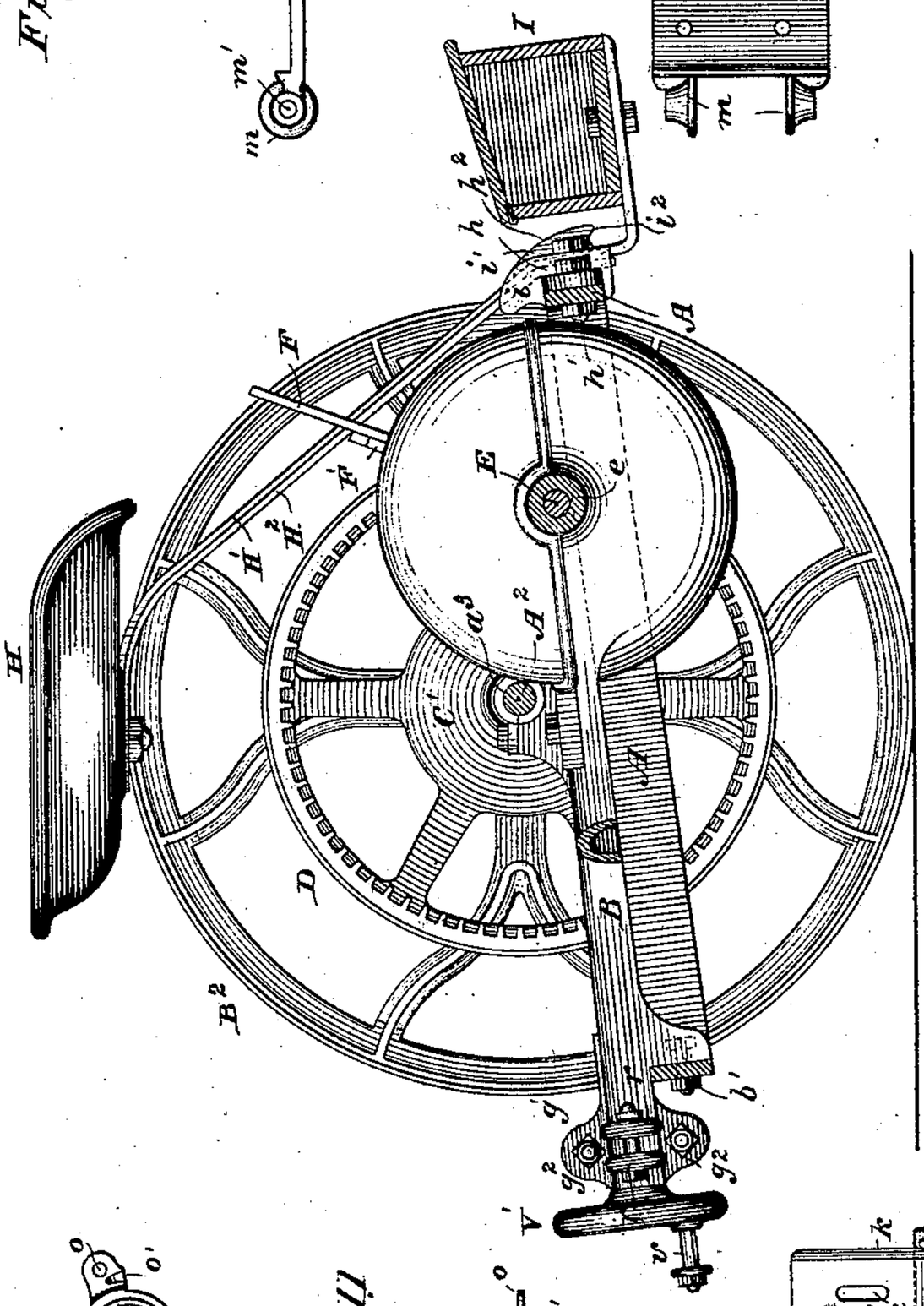


Fig. 10.

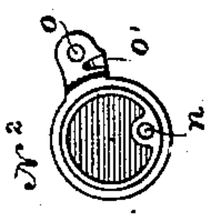
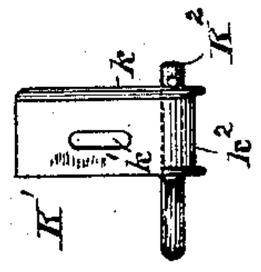


Fig. 11.

Fig. 12.



WITNESSES

Wm A Skinkle

H. W Elmore

INVENTOR

John S. Davis.

By his Attorneys,

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UNITED STATES PATENT OFFICE.

JOHN S. DAVIS, OF TOLEDO, OHIO, ASSIGNOR TO THE TOLEDO MOWER AND REAPER COMPANY, OF LUCAS COUNTY, OHIO.

HARVESTER.

SPECIFICATION forming part of Letters Patent No. 272,217, dated February 13, 1883.

Application filed October 16, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. DAVIS, of Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Harvesters, of which the following is a specification.

My objects mainly are to provide a strong, light, and durable machine, and to enable the driver readily to control its operation.

As shown by the accompanying drawings, my invention is applied to a mower or grass-cutting harvester. Some of my improvements may advantageously be used without the others, and in connection with either grass or grain harvesters.

Figure 1 is a plan or top view with parts broken away. Fig. 2 is a side elevation with parts broken away, other parts in section, and some parts detached. Fig. 3 is a front elevation, with the tongue in section. Fig. 4 is a view, partly in side elevation and partly in section on or about the line 4 4 of Fig. 1. Fig. 5 is a side elevation, showing details of the devices for throwing the cutter-actuating gearing into and out of action. Fig. 6 is a plan view of the box or bearing-sleeve for connecting the pitman and wrist-pin of the crank-wheel. Fig. 7 is a view in section on the line 7 7 of Figs. 1 and 6, showing details of the connection between the pitman and wrist-pin box. Figs. 8 and 9 are respectively a side elevation and a plan view of the shoe detached. Figs. 10 and 11 are respectively a side elevation and a plan view of an eccentric by the oscillation of which the shoe is rocked. Fig. 12 is a plan view of the adjustable bracket and its turning eyebolt for connecting the drag-bar and main-frame arm.

A two-part main frame, A B, of substantially rectangular form, is provided at its front inner corner with an inwardly-projecting arm or side extension, A′. This arm crosses in advance of and extends inside of the inner one of a pair of driving-wheels, B′ B^2, which are loosely mounted on their axle A^2. The part A of the main frame and the arm A′, as shown, are formed of one piece of wrought-iron, consisting of a bar bent into shape and riveted at *a*, one end of the bar extending slightly forward from the inner front corner of the frame proper, and being bent first downward and then inward to form the side arm, A′, crossing beneath the tongue B^3. The tongue extends back by the side of the frame, and is strongly secured to the inner side thereof by bolts *a*′— in this instance three in number. Another bolt, a^2, connects the tongue and arm A′ of the frame. Strength and stiffness are in this way attained. The portion B of the main frame is forked, is of cast-iron, and constitutes a bed-piece which supports the gearing, and is provided with the boxes for the axle and gear-shafting. This bed-piece is fitted to the bent frame-bar A and mainly within it. Bolts *b b b*′ b^2 b^2, Figs. 1 and 3, passing through suitable flanges of the bed-piece, serve to firmly unite it with the frame-bar. By forking the bed-piece, as shown, desired strength without unnecessary weight is secured. The axle turns freely in sectional boxes a^3 a^3, and the driving-wheels are connected with the axle by backing-ratchets, or so as to cause it to turn therewith when the machine is advancing and leave it free when backing. The ratchets C C′ are fastened to the axle, and spring-pawls *c*, for engagement therewith, are pivoted to spokes of the driving-wheels. The ratchet C′ for the outer driving-wheel, and an internally-toothed driving-gear, D, are rigidly connected, either by casting them together or making them separately and firmly uniting them. They are best made in one casting and connected by spokes, as shown.

A pinion, D′, is loosely mounted on a shaft, E, supported in sectional boxes *e e*′ by the bed-piece B. The pinion is driven by the gear D, and engaged with and disengaged from its shaft by suitable clutch mechanism to throw the cutters into and out of gear. As shown, the shaft E has a fixedly-attached cross-pin, *d*, at its outer end, with which the pinion is adapted to be engaged, to clutch it to its shaft, by cross-grooves in the pinion-face, into which the pinion takes, as is well understood, when the pinion is slid toward the end of the shaft and against the pin. The pinion is slid into and out of engagement with the shaft-pin by clutch-shipping mechanism, shown as formed by a fork-ended lever or rocking shipper, F, engaging a collar on the pinion-hub and mounted on a supporting arm or bracket, F′, secured

to the bed-piece by the bolts which secure the upper section of the box *e* in place. A pivot-bolt or headed pin, *f*, for the shipper is provided with a spring, *f'*, acting with a tendency to hold a stop-lug, f^2, on the shipper against movement outward or away from the upper end of the bracket F'. The stop f^2 holds the shipper against accidental movement, and so retains the pinion out of or in clutch with its shaft, according to the position of the shipper and whether the stop is bearing against the outside of the bracket, as shown, or against the opposite side thereof.

A bevel-pinion, G, on the crank-shaft G' is driven by a bevel-gear, E', on the shaft E. The crank-shaft is mounted in sectional boxes *g g'*. The box *g'* and the other boxes of the machine are so constructed and packed as to admit of adjustment to take up wear. The box *g'* is vertically divided, and is provided with two sets of bolt-lugs or securing-ears, g^2 g^2, for an obvious purpose. The packing material (leather, sheet metal, &c.) G^2 is secured between the box-sections to the thickness needed.

A driver's seat, H, is so mounted as to be located directly over the axle A^2, thus rendering variations in the weights of drivers or the presence of a driver in his seat immaterial in balancing the machine or adjusting the weight on the neck-yoke. The seat-spring is shown as double, consisting of the stem or main part H' and the leaf H^2. A bracket, *h*, secured to the front of the main frame by side lugs and bolts, *h' h'*, connecting it with the frame-bar A, serves to connect the seat-spring with the frame. A bolt, h^2, unites the spring and bracket. The downwardly-extended forwardly-bent end of the spring supports a tool-box and foot-rest, I. The spring-securing bracket has side flanges, *i i'*, to provide a seat or socket for the better attachment of the seat-spring. A stop-lug or hook-like projection, i^2, on the bracket is shown as formed with the flange *i'*. This stop serves to engage a lever, I', as farther on explained.

The side arm, A', of the main frame is braced against downward strains by an inclined bar or bracing-strap, J, secured at one end to the tongue by the bolt a^2, and bolted or riveted at its opposite end to the frame-arm. An inclined brace, J', extends forward from the frame-arm to the tongue. This brace-rod is adjustably connected to the under side of the tongue by means of a bracket, J^2, secured in place by a side flange, *j*, and a bolt, *j'*, and its nut. The forward end of the brace-rod is threaded, passes through a perforation in a rib on the under side of the bracket, and is held by nuts on each side of the rib. (See Figs. 1 and 3.) The rear end of the rod is connected with the frame-arm, near its outer end, by a bolt, j^2.

A vertically-vibrating and axially rocking drag-bar, K, has jointed connection at one end with the frame-extension or side arm, A', and extends back outside of and parallel, or nearly so, with the face of the inner driving-wheel.

To provide for the rocking of the drag-bar about its longitudinal axis, adapt it to vibrate vertically, and provide for readily fitting the parts together, the connection between the drag-bar and frame is made as follows: A bracket, K', is formed with an edge flange, *k*, to bear against the front edge of the frame-arm, with a slot, *k'*, by which it is adjustably held to the frame-arm by the bolt j^2, and with a socket or bearing, k^2, for a turning eyebolt or swivel-link, K^2, secured to the drag-bar by being passed through an eye therein. The bracket is secured to the under side of the frame-arm. In this way, as will be obvious, the drag-bar may be vibrated about the frame-arm by raising and lowering its rear end, and it is rocked axially by means of the lever I', which crosses above the drag-bar, and is pivotally connected to it by means of the upwardly-projecting lugs *l l* of a bracket, L, bolted to the under side of the drag-bar. These lugs extend up at the outer edge of the drag-bar, and a pin or bolt serves to connect the lever with them. The rocking lever extends toward the foot-rest, in front of the inner driving-wheel and beneath the tongue, and is bent upward and then horizontally, or nearly so, terminating near the outer driving-wheel in a foot-rest or curve, L', convenient to the foot of the driver while in his seat. The tongue serves to prevent too great upward movement of this lever when the drag-bar rocks in one direction, while the stop i^2 serves to hold the lever at the limit of its downward movement when the drag-bar is rocked in the opposite direction, for purposes farther on to be explained. At its rear end the drag-bar K passes beneath a shoe, M, and is then bent upwardly and jointed to the heel of the shoe. A bearing sleeve or socket, M', at the upturned rear end of the drag-bar, lugs *m m* on the shoe-heel, and a pivot-pin, *m'*, serve to make the jointed connection between the shoe and drag-bar. The shoe is made to vibrate vertically by rocking it about its heel-pivot by the means and in the manner next to be described.

At its forward end the shoe projects upwardly, and terminates in a bearing ring or socket, N, for an eccentric, shown as formed by a disk, N^2, and a pin, *n*, rigidly but detachably connected with it near its periphery, and constituting the shaft about which it is rocked in the shoe-bearing. A hollow eccentric stand and bracket-housing, N', is firmly connected by its flanged base and bolts to the drag-bar. A rear opening, *n'*, in the housing serves to admit the front end of the shoe, with the eccentric-disk in place, (before hinging the shoe-heel to the drag-bar and without the pin *n*,) and a front opening, n^2, in the housing accommodates a rod, O, which is pivotally connected with a short arm or ear, *o*, on the eccentric. After the parts are adjusted the pin *n* is driven tightly in place. Slots O' (only one of which is shown) are made opposite each other in the side walls of the housing, for the eccentric-axis to play in as

the eccentric is rocked by the manipulation of the rod O by means such as soon to be described. This rod is connected by its bent rear end with the eccentric-arm before the eccentric and shoe are inserted in the housing. Disconnection of the rod is prevented by its contact with the adjacent wall of the housing. A side lug or dog, o', on the eccentric-arm o comes in contact with a stop-lug or shoulder, o^2, on the eccentric-bearing, to limit the rock of the shoe upward at its front by the oscillation of the eccentric in the direction in which it is turned by pulling strain on the rod O. The downward movement of the front end of the shoe, as the shoe is vibrated about its heel-pivot by the thrust of the rod O, is limited by contact of the shoe with the drag-bar.

A shoe-tilting lever, O′, connected with the rod O, is pivoted upon a stand or bracket, O^2, which is secured to the frame-arm A′ by its flanged base and the bolt j^2, which secures the drag-bar bracket K′ and brace-rod J′ to the frame-arm. The tilting lever is provided with suitable detent devices, shown as consisting of the rack-teeth P, formed with the bracket O^2, and the controlling-rod P′, connected with the spring-actuated rocking stop-lug or dog p, pivoted to the lever to engage the rack. The lever O′ is adjustably connected with the rod O in such manner as ot admit of the turning of this rod to accommodate the axial rocking movement of the drag-bar K. A socketed screw-threaded coupling-sleeve, p', fitted to the pin or bent end p^2 of the lever by its socket and the threaded end of the rod O, is screwed into the sleeve.

An inclined rod, Q, connected at its opposite ends to the drag-bar K, near its front end, and to the eccentric stand or housing, serves to mutually brace and strengthen the drag-bar and housing. A bolt unites the brace to the drag-bar, and a perforated lug, q, on the housing receives the threaded rear end of the brace-rod, which is secured by jam-nuts on opposite sides of the lug. A finger-beam, Q′, is rigidly secured at its heel end to the shoe in suitable way, and is provided with the usual guards and cutters to complete well-known cutting apparatus.

A hinged brace-bar or coupling-arm, R, connects the cutting apparatus with the outer rear corner of the main frame, as will farther on be fully explained.

From the above description it will be seen that while the outer end of the cutting apparatus is prevented from dropping too low by contact of the lever I′ with the under side of the tongue, or by the pressure of the driver's foot, the usually employed device for stiffening the finger-beam preparatory to raising its outer end is dispensed with, and the outer end of the cutting apparatus raised simply by depressing the treadle end of the lever I′, and so rocking the drag-bar. It will further be seen that in addition to the facility afforded the driver for tilting the guards by the employment of the eccentric, &c., the cutting apparatus is very strongly braced against backward strains by means of the extended front end of the shoe, the housing in which it works, and a shoulder or projection, q', on the shoe, which, by contact with the wall of the housing, lessens the strain upon the shoe front or eccentric-bearing arising from backward or thrusting strains on the cutting apparatus.

The coupling-arm R is pin-jointed at its heel end to lugs r r of the main frame. These lugs are formed with the rearwardly-projecting portion of the bed-piece of the frame near the outer rear corner of the bent frame-bar. The connection between the outer end of the coupling-arm and the cutting apparatus is by way of short arms or lugs R′ r' on the front portion of the shoe. The coupling-arm is pin-jointed to those lugs, one of which is made longer than the other, and provided with a recess or half-round groove, s, in its top, (see Fig. 9,) so that when the cutting apparatus is elevated for transportation it may be held up by a pin or bolt passing through a hole, S, in the coupling-arm and engaging the groove s of the arm R′.

The cutting apparatus is raised and lowered bodily or throughout its entire length by means of a rocking lifting-lever, T, flexibly connected with the coupling-arm. This lever is mounted at or near the inner rear corner of the main frame through or by way of the heel end of the tongue. The lever is provided with a hook, t, and segment-sheave t', and is pivoted at t^2 to a frame-stand or bracket, T′, which is secured by its flanged base and the rearmost one of the bolts a' to the tongue-heel and frame-bar. A chain, T^2, connects the lever-hook and the coupling-arm. The lever, when rocked forward and downward to the limit of its movement in raising the cutting apparatus, engages with a catch-bar or detent formed by the hook or catch u of a flexible bar or strap iron, U, secured to the tongue and frame-bar by the foremost one of the bolts a'. A side lug or lateral projection, u', of the lever-bracket serves as a stop against which the lower end of the sheave-segment t' abuts to limit the backward rock of the lifting-lever and descent of the inner end of the cutting apparatus.

A pitman, V, is adjustably connected at its inner end with the ordinary wrist-pin, v, of the crank-wheel V′ by means of a threaded coupling-sleeve, V^2, into which the threaded end of the pitman is screwed and held by a jam-nut, v^2, and a box or bearing-sleeve, V^3, fitting the wrist-pin and pivoted to its coupling-sleeve. The box V^3 is provided with an oil-hole, and held to the wrist-pin by a nut and washer, as usual, and has a perforated ear, v^3, which fits between corresponding ears, V^4 V^4, on the coupling-sleeve. A tubular pivot-pin, v^4, preferably made of wood, to serve as an inexpensive and readily-removable bushing and prevent noise, passes through the holes in the ears of the coupling-sleeve and box, and is removably held to its place by a screw-bolt, v^5, with its nut and washers.

I do not herein claim the above-described

means for connecting the pitman and crank-wheel.

The pitman is connected with the knife-heel or inner end of the cutter-bar by a ball-and-socket joint in the following way: The inner section or heel attachment, W, of the knife-bar has the hollow ball *w* formed with it, and the pitman is forked or split, and each of the two arms W′ W′ of the fork is provided with a half socket or cup, *w′*, which embrace the ball and are caused to properly clasp it by means of the adjusting screw-bolt w^2 and its nut. One of the jaws or arms W′ of the pitman is threaded for engagement by the screw of the bolt, so that the arms may be separated or drawn together, as desired, and when adjusted be held, with the aid of the jam-nut, on the bolt end. In this way wear may be compensated for readily. Oil-holes are drilled in the opposite sides of the ball *w*, where it is embraced by the cups *w′ w′*, and an opening is made through the top of the ball, so that it may be filled with lubricant (oil and cotton waste, tallow, &c.) to keep the joint lubricated without waste.

I claim as of my own invention—

1. The combination of the one-part wrought-iron frame-bar having the side arm, A′, formed with it, the tongue extending back over the arm and by the side of the frame-bar, and the bolts connecting the tongue with said arm and to the side of the frame-bar, as described.

2. The combination, substantially as hereinbefore set forth, of the wrought-iron frame-bar bent into shape and forming the side arm, A′, the forked cast-iron bed-piece, the tongue extending back by the side of the frame and bolted thereto, and the bolt connecting the tongue with the side arm of the frame, for the purpose set forth.

3. The combination of the main frame, the tongue bolted to the side thereof, the side arm of the frame, crossing beneath the tongue and bolted thereto, and the bracing-strap for sustaining the frame-arm against downward strains, substantially as and for the purpose hereinbefore set forth.

4. The combination of the main frame, the tongue secured thereto, the side arm of the frame extending inwardly beneath the tongue and bolted thereto, and the inclined brace J′, adjustably connecting the tongue and side arm, substantially as and for the purpose hereinbefore set forth.

5. The combination of the frame-bar, the bracket secured to the frame-bar, the seat-spring secured to the bracket and bent downwardly and forwardly therefrom, and the foot-rest, substantially as and for the purpose hereinbefore set forth.

6. The seat-spring securing bracket provided with the stop-lug, as and for the purpose described.

7. The combination, substantially as hereinbefore set forth, of the main frame, the tongue, the axially-rocking and vertically-vibrating drag-bar, and the bent rocking lever having jointed connection with the top outer edge of the drag-bar and extended beneath the tongue and toward the outer driving-wheel, for the purpose described.

8. The combination of the main frame, its side arm, the axially-rocking and vertically-vibrating drag-bar jointed to the side arm, the rocking lever having jointed connection with the drag-bar, and means for holding the lever when rocked downward, substantially as and for the purpose hereinbefore set forth.

9. The combination of the main frame, the tongue, the side arm of the frame, the drag-bar jointed to the side arm, the bent rocking lever having jointed connection with the top outer edge of the drag-bar, and provided with the foot-rest, and the stop i^2 for the lever, substantially as and for the purpose hereinbefore set forth.

10. The combination, substantially as hereinbefore set forth, of the drag-bar, the shoe jointed to the drag-bar, and having the bearing ring or socket at front, the eccentric fitted in said socket, the housing for the eccentric and front end of the shoe, secured to the drag-bar, and means by which to oscillate the eccentric, for the purpose described.

11. The combination of the shoe provided with the eccentric socket, the drag-bar beneath it, and to which it is jointed at its heel, the eccentric, the stand or housing secured to the drag-bar, the eccentric pin playing in slots in the housing, the connecting-rod, the eccentric-arm to which it is pivoted, and the tilting lever with which the rod connects, substantially as and for the purpose hereinbefore set forth.

12. The combination of the drag-bar, the shoe jointed at its heel thereto, the eccentric-socket at the front upwardly-projecting end of the shoe, the housing secured to the drag-bar, and having the front and rear openings and the side slots, the eccentric and its pin, the arm on the eccentric, the side lug on the arm, and the shoulder or stop-lug on the socket, substantially as and for the purpose hereinbefore set forth.

13. The combination, substantially as hereinbefore set forth, of the main frame, its side arm, the axially-rocking drag-bar having jointed connection with said arm, means for rocking the drag-bar, the shoe beneath which the drag bar passes and with the heel of which the drag-bar is jointed, the eccentric-socket at the front of the shoe, the eccentric, and means by which it is oscillated to tilt the shoe, for the purpose described.

14. The combination of the axially-rocking drag-bar, the shoe jointed at its heel to the drag-bar, the eccentric-socket at the front of the shoe, the eccentric, the housing secured to the drag-bar, and having the slots for the pin of the eccentric, the connecting-rod having jointed connection with the eccentric, the screw threaded coupling of the connecting-rod, and the tilting-lever, substantially as and for the purpose hereinbefore set forth.

15. The combination, substantially as here

inbefore set forth, of the main frame, the tongue, the axially-rocking and vertically-vibrating drag-bar, the cutting apparatus, the foot-lever directly connected with the drag-bar and passing beneath the tongue, the coupling-arm, and the lifting-lever flexibly connected therewith, for the purpose described.

16. The combination of the main frame, the coupling-arm provided with the hole S, the shoe, and the lug R′ on the shoe, provided with the groove *s*, as and for the purpose hereinbefore set forth.

In testimony whereof I have hereunto subscribed my name.

JOHN S. DAVIS.

Witnesses:

GEO. W. HUMPHREY,

WILLIE HUMPHREY.